

METHOD FOR DETERMINING PRESSURE OF EARTH FORMATIONS

ABSTRACT

A method for determining formation pressure at a depth region of formations surrounding a borehole, including: keeping track of the time since cessation of drilling at the depth region; deriving formation permeability at the depth region; causing wellbore pressure to vary periodically in time and determining, at the depth region, the periodic and non-periodic component of pressure measured in the formations; determining, using the time, the periodic component and the permeability, the formation pressure diffusivity and transmissibility and an estimate of the size of the pressure build-up zone around the wellbore at the depth region; determining, using the time, the formation pressure diffusivity and transmissibility, and the non-periodic component, the leak-off rate of the mudcake at the depth region; determining, using the leak-off rate, the pressure gradient at the depth region; and extrapolating, using the pressure gradient and the size of the build-up zone, to determine the formation pressure.